2006-08 ENGINE

Cylinder Head - Civic GX

COMPONENT LOCATION INDEX

NOTE: Refer to the CYLINDER HEAD (EXCEPT HYBRID) article for items not shown in this article.

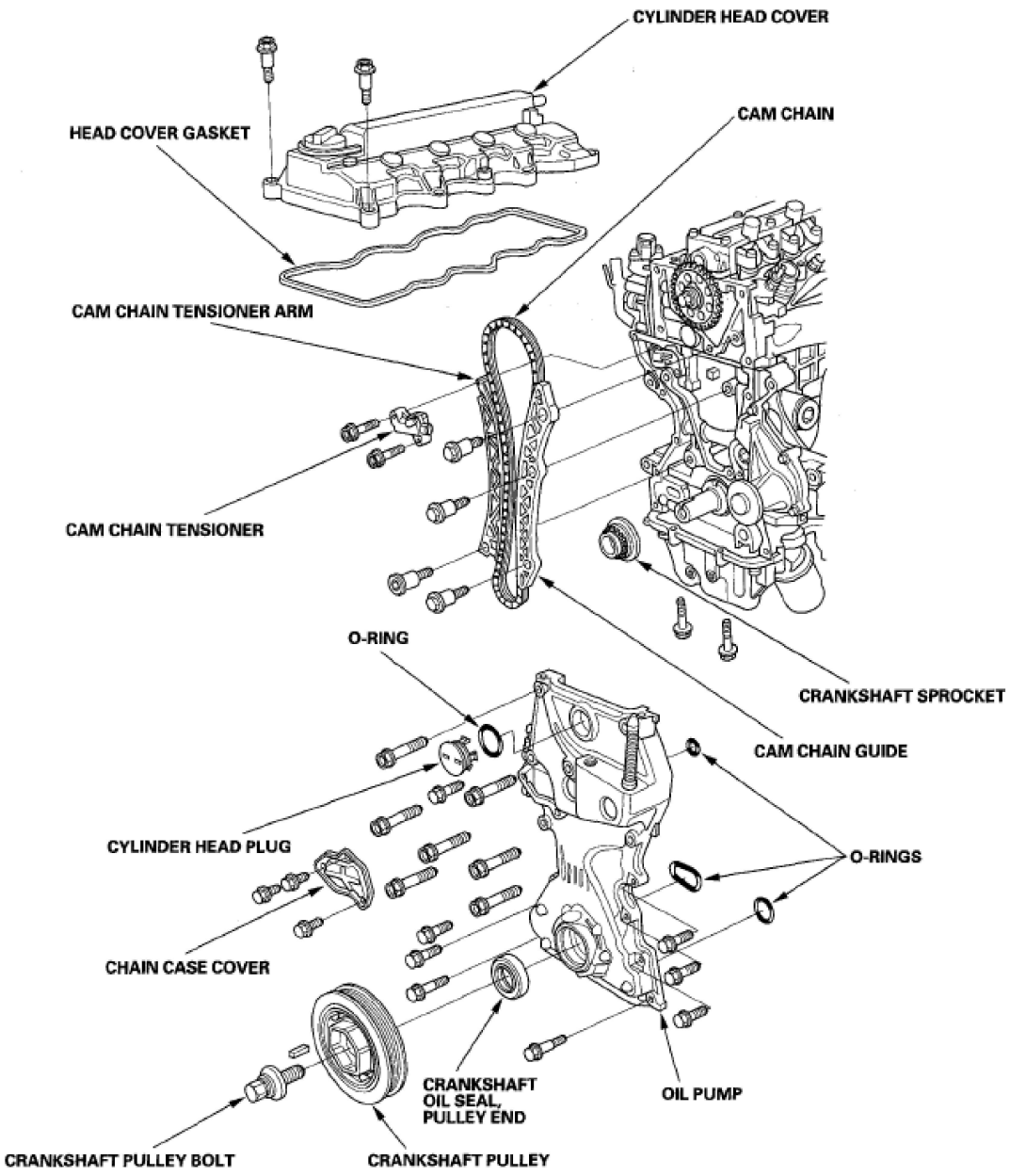

Fig. 1: Identifying Cylinder Head Components (1 Of 3)

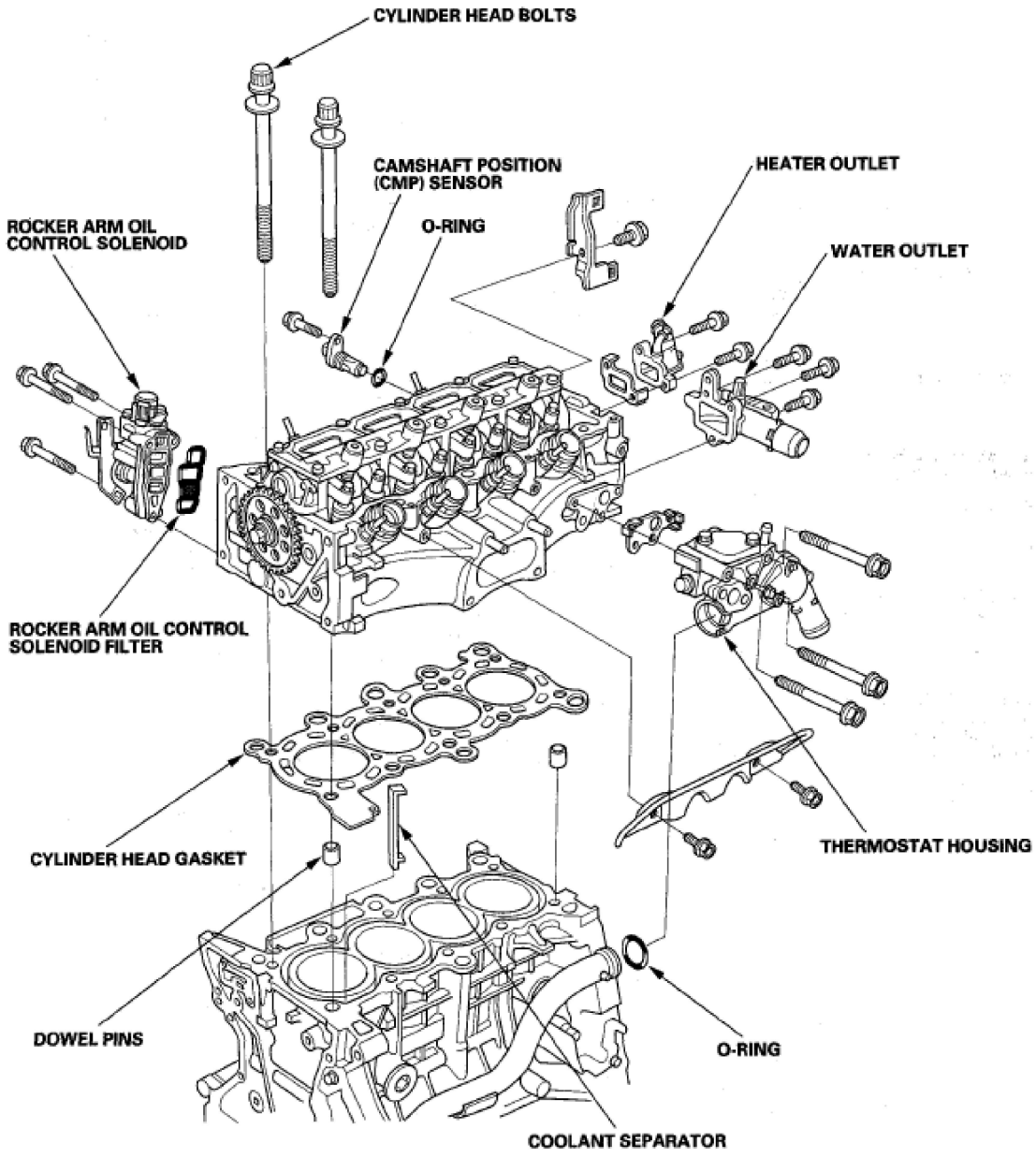

Fig. 2: Identifying Cylinder Head Components (2 Of 3)

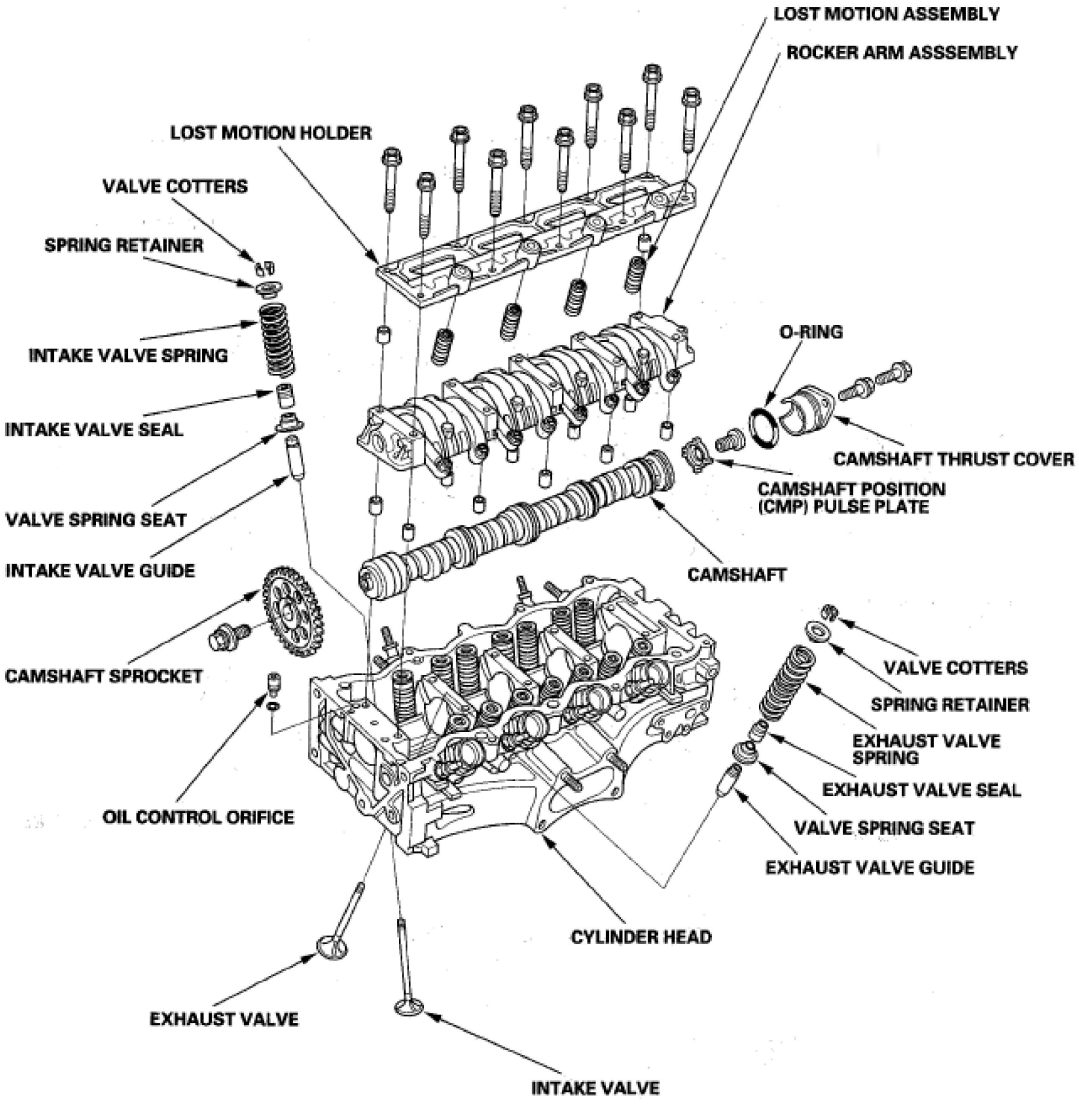

Fig. 3: Identifying Cylinder Head Components (3 Of 3)

CYLINDER HEAD REMOVAL

NOTE:

- **Use fender covers to avoid damaging painted surfaces.**
- **To avoid damage, unplug the wiring connectors carefully while holding the connector portion.**
- **To avoid damaging the cylinder head, wait until the engine coolant temperature drops below 100 ℉ (38 ° C) before loosening the cylinder head bolts.**
- **Mark all wiring and hoses to avoid misconnection. Also,**

be sure that they do not contact other wiring or hoses, or interfere with other parts.

1. Make sure you have anti-theft codes for the audio system and navigation system (if equipped), then write down the audio presets.
2. Turn off the manual shut-off valve, (see **ENGINE REMOVAL**).
3. To reduce pressure in the lines, start the engine, and run it until it stalls.
4. Disconnect the negative cable from the battery.
5. Drain the engine coolant, refer to the **COOLANT REPLACEMENT** .
6. Remove the drive belt, refer to the **DRIVE BELT REMOVAL/INSTALLATION** .
7. Remove the intake manifold (see **REMOVAL**).
8. Remove the harness clamps (A), and remove the positive crankcase ventilation (PCV) hose from the clamp (B).

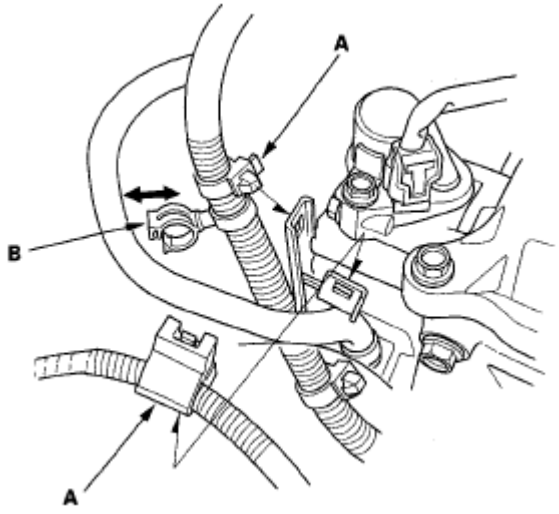

Fig. 4: Removing Harness Clamps

9. Remove the air cleaner housing bracket (A), then remove the harness holder (B) from the cylinder head.

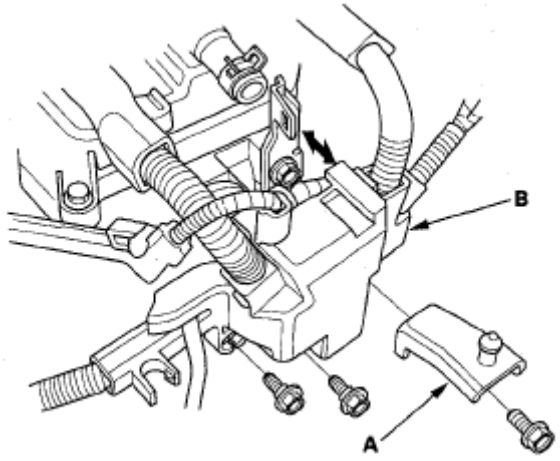

Fig. 5: Identifying Air Cleaner Housing Bracket

10. Remove the upper radiator hose (A), heater hose (B), and water bypass hose (C).

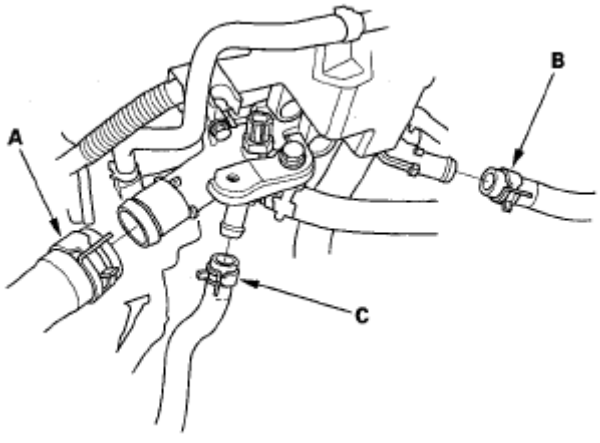

Fig. 6: Identifying Upper Radiator Hose, Heater Hose And Water Bypass Hose

11. Remove the engine wire harness connectors and wire harness clamps from the cylinder head.
    - Four fuel injector connectors
    - Engine coolant temperature (ECT) sensor 1 connector
    - Air fuel ratio (A/F) sensor connector
    - Secondary heated oxygen sensor (secondary HO2S) connector
    - Rocker arm oil control solenoid connector

- Rocker arm oil pressure switch connector

12. Remove the four ignition coils, refer to the **IGNITION COIL REMOVAL/INSTALLATION** .
13. Remove the three way catalytic converter (TWC) (see **CATALYTIC CONVERTER REMOVAL/INSTALLATION**).
14. Remove the thermostat housing, refer to the **THERMOSTAT HOUSING REMOVAL AND INSTALLATION** .
15. Remove the cam chain, refer to the **CAM CHAIN REMOVAL** .
16. Remove the cylinder head bolts. To prevent warpage, unscrew the bolts, in sequence, 1/3 of a turn at a time; repeat the sequence until all bolts are loosened.

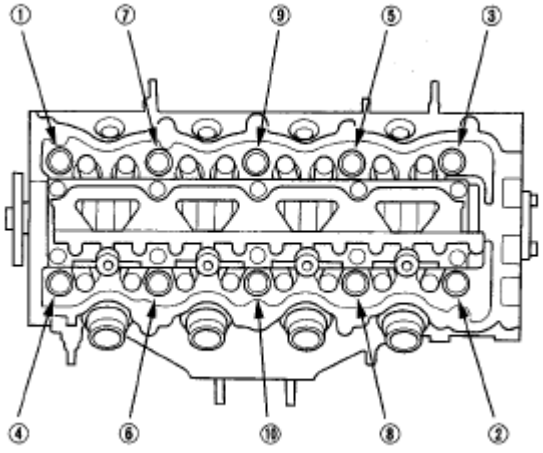

Fig. 7: Identifying Loosening Sequence Of Cylinder Head Bolts

17. Remove the cylinder head.

CAMSHAFT INSPECTION

1. Remove the camshaft sprocket, refer to the **CAMSHAFT SPROCKET REMOVAL AND INSTALLATION** .
2. Remove the rocker arm assembly, refer to the **ROCKER ARM ASSEMBLY REMOVAL** .
3. Put the rocker shaft holders on the cylinder head, then tighten the bolts, in sequence, to the specified torque.

Specified Torque:

6 x 1.0 mm

15 N.m (1.5 kgf.m, 11 Ibf.ft)

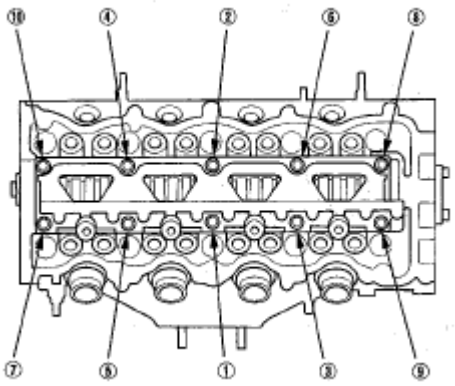

Fig. 8: Identifying Tightening Sequence Of Cylinder Head Bolts

4. Seat the camshaft by pushing it toward the rear of the cylinder head.
5. Zero the dial indicator against the end of the camshaft. Push the camshaft back and forth, and read the end play. If the end play is beyond the service limit, replace the thrust cover and recheck. If it is still beyond the service limit, replace the camshaft.

Camshaft End Play

Standard (New): 0.050-0.250 mm

(0.002-0.010 in.)

Service Limit: 0.4 mm (0.02 in.)

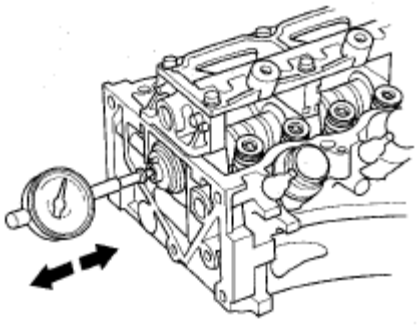

Fig. 9: Measuring Camshaft End Play

6. Remove the camshaft, refer to the **CAMSHAFT REMOVAL** .
7. Wipe the camshaft clean, then inspect the lift ramps. Replace the camshaft if any lobes are pitted, scored, or excessively worn.
8. Measure the diameter of each camshaft journal.

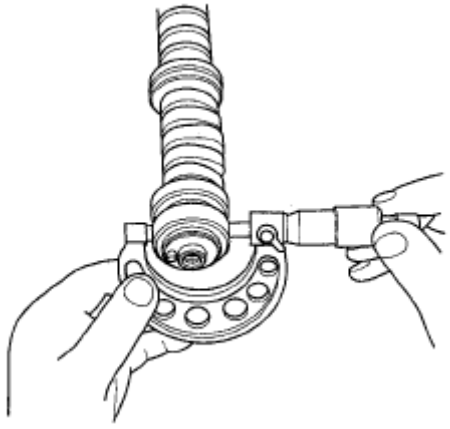

Fig. 10: Measuring Diameter Of Camshaft Journal

9. Zero the gauge to the journal diameter.

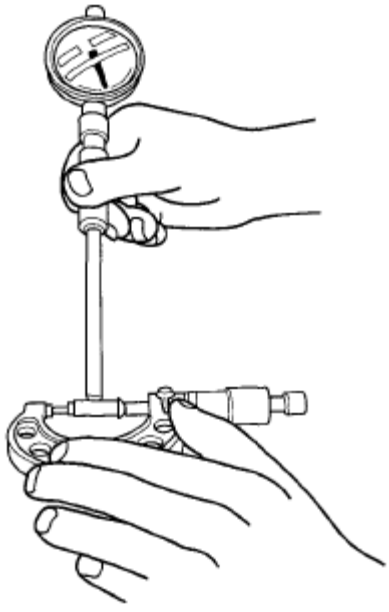

Fig. 11: Checking Zero Gauge To Journal Diameter

10. Clean the camshaft bearing surfaces in the cylinder head. Measure the inside diameter of each camshaft bearing surface, and check for an out-of-round condition.
    - If the camshaft-to-holder clearance is within limits, go to step 12.
    - If the camshaft-to-holder clearance is beyond the service limit, and the camshaft has been replaced, replace the cylinder head.
    - If the camshaft-to-holder clearance is beyond the service limit, and the camshaft has not been replaced, go to step 11.

Camshaft-to-Holder Oil Clearance

Standard (New): 0.045-0.084 mm

(0.0018-0.0033 in.)

Service Limit: 0.15 mm (0.006 in.)

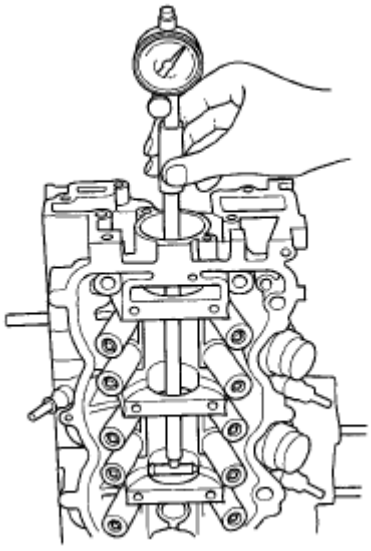

Fig. 12: Checking Camshaft-To-Holder Oil Clearance

11. Check the total runout with the camshaft supported on V-blocks.
    - If the total runout of the camshaft is within the service limit, replace the cylinder head.
    - If the total runout is beyond the service limit, replace the camshaft, and recheck the oil clearance. If the oil clearance is still out of tolerance, replace the cylinder head.

Camshaft Total Runout

Standard (New): 0.03 mm (0.001 in.) max.

Service Limit: 0.04 mm (0.002 in.)

Camshaft Total Runout
Standard (New): 0.03 mm (0.001 in.) max.
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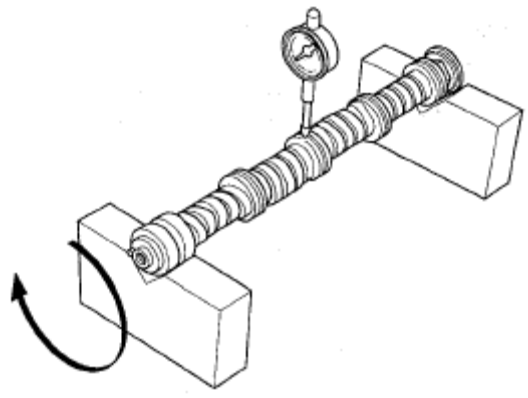

Fig. 13: Measuring Camshaft Total Runout

12. Measure cam lobe height.

Cam Lobe Height Standard (New):

	INTAKE	EXHAUST
PRI	34.222 mm (1.3473 in.)	34.387 mm (1.3538 in.)
SEC A	33.879 mm (1.3338 in.)	
SEC B	34.384 mm (1.3537 in.)	

PRI: Primary SEC: Secondary IN: Intake
EX: Exhaust C/C: Cam Chain

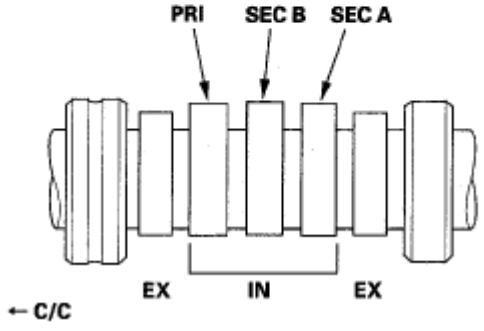

Fig. 14: Measuring Cam Lobe Height

VALVE SEAT RECONDITIONING

1. Inspect the valve stem-to-guide clearance, refer to the **VALVE STEM-TO-GUIDE CLEARANCE INSPECTION** . If the valve guides are worn, replace them, refer to the **VALVE GUIDE REPLACEMENT** before cutting the

valve seats.

2. Renew the valve seats in the cylinder head using a valve seat cutter.

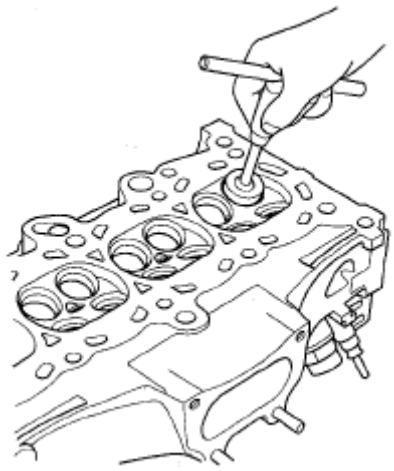

Fig. 15: Making Valve Seats In Cylinder Head

3. Carefully cut a 45 °seat, removing only enough material to ensure a smooth and concentric seat.
4. Bevel the upper edge of the seat with the 30° cutter and the lower edge of the seat with the 60° cutter. Check the width of the seat and adjust accordingly.

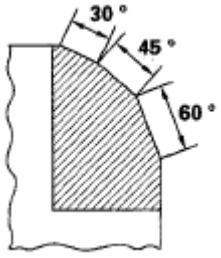

Fig. 16: Identifying Upper And Lower Edge Angle Of Seat

5. Make one more very light pass with the 45° cutter to remove any possible burrs caused by the other cutters.

Valve Seat Width

Intake:

Standard (New): 1.25-1.55 mm (0.049-0.061 in.)

Service Limit: 2.0 mm (0.08 in.)

Exhaust:

Standard (New): 1.45-1.75 mm (0.057-0.069 in.)

Service Limit: 2.2 mm (0.09 in.)

6. After resurfacing the seat, inspect it for even valve seating. Apply Prussian Blue compound (A) to the valve face. Insert the valve in its original location in the head, then lift it and snap it closed against the seat several times.

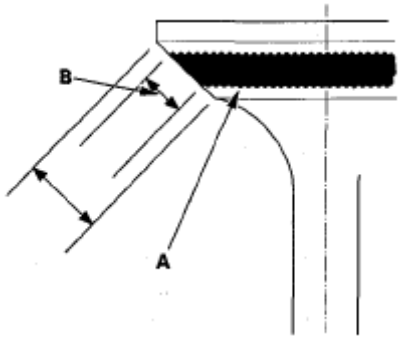

Fig. 17: Identifying Valve Seat Width

7. The actual valve seating surface (B), as shown by the blue compound, should be centered on the seat.
   - If it is too high (closer to the valve stem), you must make a second cut with the 60° cutter to move it down, then one more cut with the 45° cutter to restore seat width.
   - If it is too low (closer to the valve edge), you must make a second cut with the 30° cutter to move it up, then one more cut with the 45° cutter to restore seat width.

NOTE: The final cut should always be made with the 45° cutter.

8. Insert the intake and exhaust valves in the head, and measure the valve stem installed height (A).

Intake Valve Stem Installed Height

Standard (New): 67.2-67.4 mm

(2.646-2.654 in.)

Service Limit: 67.7 mm (2.665 in.)

Exhaust Valve Stem Installed Height

Standard (New): 58.4-58.6 mm

(2.299-2.307 in.)

Service Limit: 58.9 mm (2.319 in.)

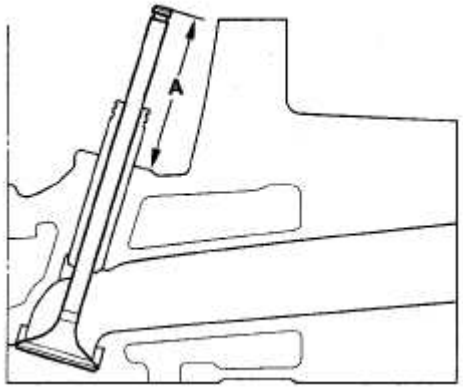

Fig. 18: Identifying Valve Stem Installed Height

9. If the valve stem installed height is beyond the service limit, replace the valve and recheck. If it is still beyond the service limit, replace the cylinder head; the valve seat in the head is too deep.

CYLINDER HEAD INSTALLATION

1. Clean the cylinder head and block surface.
2. Install the new coolant separator (A) in the engine block when replacing the engine block.

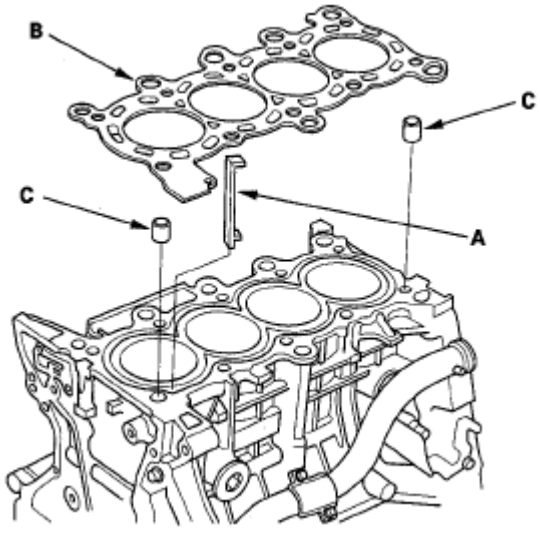

Fig. 19: Identifying Cylinder Head Gasket And Dowel Pins

3. Install the new cylinder head gasket (B) and dowel pins (C) on the engine block. Always use a new cylinder head gasket.
4. Set the crankshaft to top dead center (TDC). Align the TDC mark (A) on the crankshaft sprocket with the pointer (B) on the engine block.

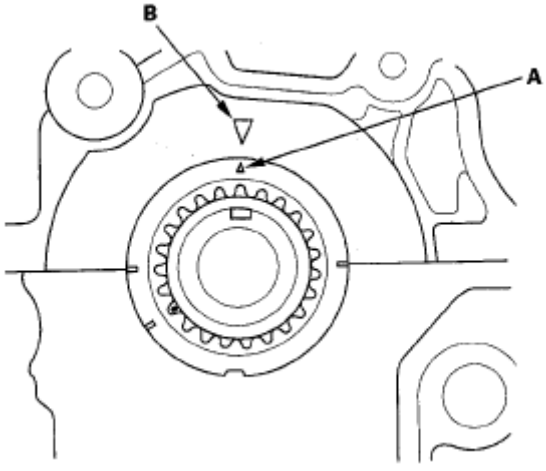

Fig. 20: Aligning TDC Mark On Crankshaft Sprocket With Pointer

5. Set the camshaft TDC. The "UP" mark (A) on the camshaft sprocket should be at the top, and the TDC grooves (B) on the camshaft sprocket should line up with the top edge of the head.

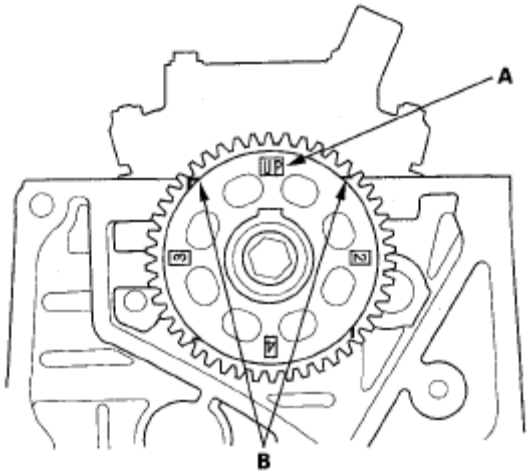

Fig. 21: Identifying Camshaft TDC Up Mark On Camshaft Sprocket

6. Install the cylinder head on the block.
7. Measure the diameter of each cylinder head bolt at point A and point B.

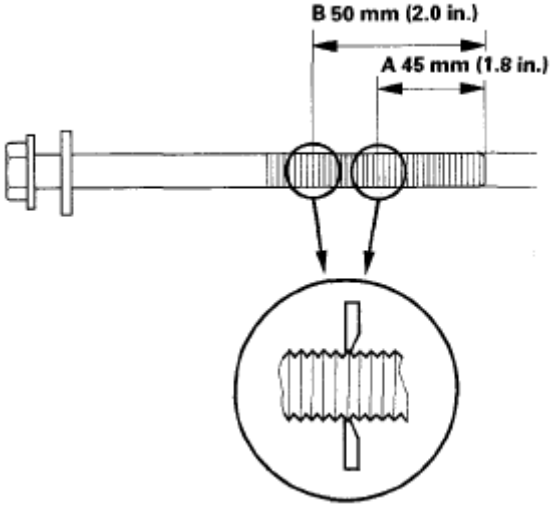

Fig. 22: Measuring Diameter Of Cylinder Head Bolt

8. If either diameter is less than 10.6 mm (0.42 in.), replace the cylinder head bolt.
9. Apply new engine oil to the threads and under the bolt heads of all cylinder head bolts.
10. Tighten the cylinder head bolts in sequence to 39 N.m (4.0 kgf-m, 29 Ibf-ft). Use a beam-type torque wrench. When using a preset-type torque wrench, be

sure to tighten slowly and do not overtighten. If a bolt makes any noise while you are torquing it, loosen the bolt and retighten it from the first step.

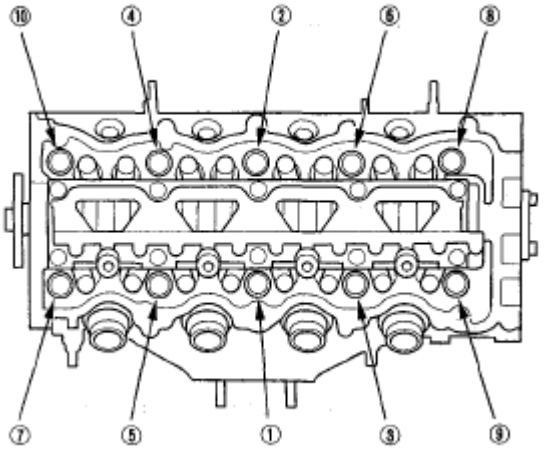

Fig. 23: Identifying Tightening Sequence Of Cylinder Head Bolts

11. After torquing, tighten all cylinder head bolts in two steps (90° per step). If you are using a new cylinder head bolt, tighten the bolt an extra 60°.

NOTE: Remove the cylinder head bolt if you tightened it beyond the specified angle, and go back to step 7 of the procedure. Do not loosen it back to the specified angle.

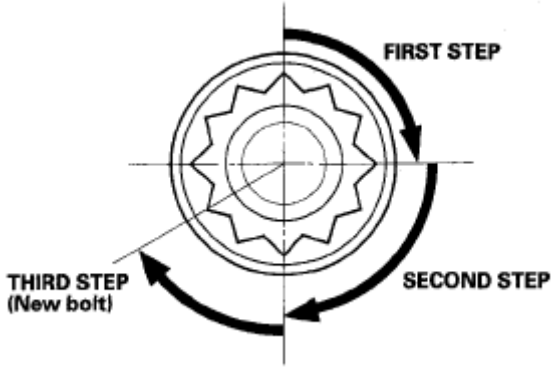

Fig. 24: Identifying Cylinder Head Bolt Tightening Steps

12. Install the cam chain, refer to the **CAM CHAIN INSTALLATION** .
13. Adjust the valve clearance, refer to the **VALVE CLEARANCE ADJUSTMENT** .

14. Install the cylinder head cover, refer to the **CYLINDER HEAD COVER INSTALLATION** .
15. Install the thermostat housing (see **INSTALLATION**).
16. Install the three way catalytic converter (TWC) (see **CATALYTIC CONVERTER REMOVAL/INSTALLATION**).
17. Connect the engine wire harness connectors, and install the wire harness clamps to the cylinder head.
    - Four fuel injector connectors
    - Engine coolant temperature (ECT) sensor 1 connector
    - Air fuel ratio (A/F) sensor connector
    - Secondary heated oxygen sensor (secondary HO2S) connector
    - Rocker arm oil control solenoid connector
    - Rocker arm oil pressure switch connector
18. Install the upper radiator hose (A), heater hose (B), and water bypass hose (C).

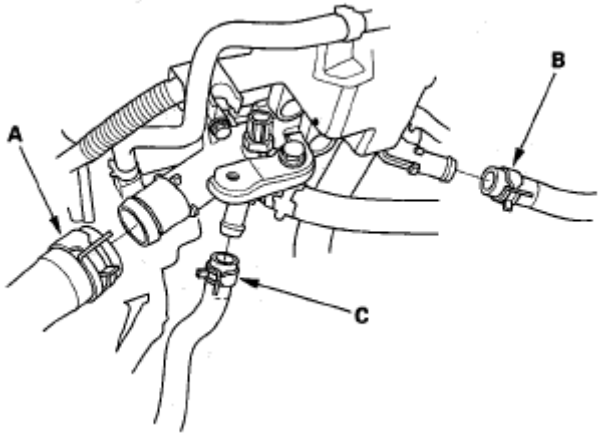

Fig. 25: Identifying Upper Radiator Hose, Heater Hose And Water Bypass Hose

19. Install the harness holder (A) on the cylinder head, then Install the air cleaner housing bracket (B).

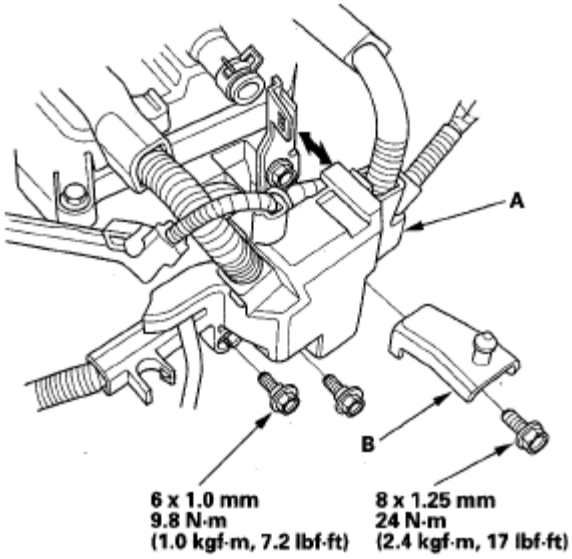

Fig. 26: Identifying Air Cleaner Housing Bracket (With Torque Specifications)

20. Install the harness clamps (A), and remove the positive crankcase ventilation (PCV) hose from the clamp (B).

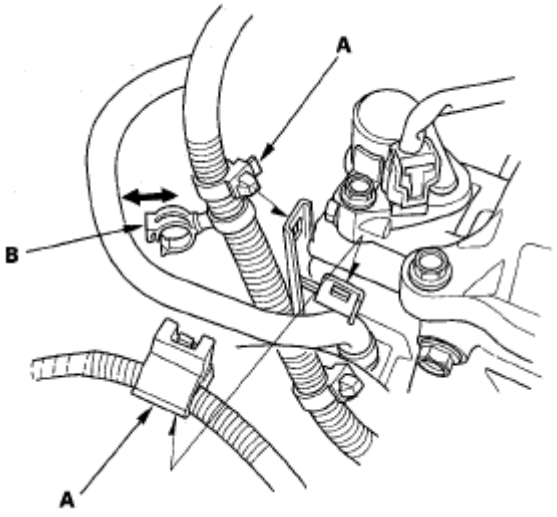

Fig. 27: Identifying Positive Crankcase Ventilation (PCV) Hose Clamp

21. Install the intake manifold (see **INSTALLATION**).
22. Install the drive belt, refer to the **DRIVE BELT REMOVAL/INSTALLATION** .
23. Clean the battery posts and cable terminals with sandpaper. Assemble them,

and apply grease to prevent corrosion.

24. After installation, check that all tubes, hoses and connectors are installed correctly.
25. Do the leak Inspection (see **LEAK INSPECTION**).
26. Refill the radiator with engine coolant, and bleed air from the cooling system with the heater valve open, refer to the step 8 on **COOLANT REPLACEMENT** .
27. Do the crankshaft position (CKP) pattern clear/CKP pattern learn procedure (see **CRANK (CKP) PATTERN CLEAR/CRANK (CKP) PATTERN LEARN**).
28. Do the power window control unit reset procedure, refer to the **RESETTING THE POWER WINDOW CONTROL UNIT** .
29. Inspect the idle speed, refer to the **IDLE SPEED INSPECTION** .
30. Inspect the ignition timing, refer to the **IGNITION TIMING INSPECTION** .
31. Enter the anti-theft codes for the audio system and navigation system (if equipped).
32. Set the clock.